

REMARKS

Entry of the foregoing, further examination and reconsideration of the subject application are respectfully requested in light of the amendments above and the comments which follow.

As correctly noted in the Official Action Summary, Claims 25-29 and 31 have been withdrawn and Claims 17-24, 30, and 32-34 are pending.

Upon entry of the present response, Claims 17-24, 30, and 32-34 remain pending and await further consideration on the merits.

Rejection under 35 U.S.C. §103

The Official Action rejected Claims 17-24, 30, and 32-34 under 35 U.S.C. §103(a) as allegedly unpatentable over U.S. Patent No. 6,214,306 to Aubert et al. ("Aubert"). Specifically, the Official Action alleges that Aubert teaches a zirconium oxide based composition comprising cerium oxide and at least one dopant. However, the Official Action admits that Aubert is silent regarding the surface area after calcination for 6 hours at 1150°C, but alleges that Aubert discloses generally high surface areas at 900°C and 1000°C, including of at least 60 m²/g after calcination at 1000°C. Thus, the Official Action alleges that the high surface areas are either inherent or obvious (Official Action at pages 3-5). Further, the Official Action alleged that regarding the weight percentages of the oxides and containing more than one rare earth metal, *Aubert* teaches similar ranges for the zirconium and cerium oxides. Thus, the Official Action alleges that it would have been obvious to optimize the ranges to create a product of a high surface area at a high temperature (Official Action at page 4).

The present invention is directed to a composition based on zirconium oxide and oxides of cerium, lanthanum and another rare earth element. Compositions formed according to the present invention are especially suitable for use as multifunctional catalysts. Compositions formed according to the principles of the present invention also exhibit exceptional surface area stability under high temperatures. This surface area stability enhances the catalytic effect of the composition. A composition formed according to certain aspects of the present invention is set forth in amended claim 17. Claim 17 recites:

17. A composition based on zirconium oxide comprising cerium oxide in an atomic ratio $Zr/Ce > 1$, and further comprising lanthanum oxide and an oxide of a rare earth other than cerium and lanthanum, the composition having a sulphur content below 200 ppm, wherein after calcination for 6 hours at $1150^{\circ}C$ it has a specific surface of at least $10\text{ m}^2/g$.

As evident from the above, Claim 17 requires, *inter alia*, a composition wherein "after calcination for 6 hours at $1150^{\circ}C$ it has a specific surface of at least $10\text{ m}^2/g$." However, as admitted on page 5 of the Official Action, *Aubert* is silent as to this aspect of the presently claimed invention.

It is alleged on page 5 of the Official Action: "the high surface areas are either found to be inherent in the products of *Aubert '306* or they would have been obvious to one of ordinary skill in the art to create through optimization of dopants".

When assertions are made based upon features that are not expressly disclosed in the prior art, the Federal Circuit has repeatedly stated that in order to establish the inherency of the missing element it must be shown that the missing element must necessarily be present in the reference, and would be recognized as such by those persons of ordinary skill in the art. *Continental Can Co. USA v. Monsanto Co.*, 948 F.2d 1264, 20 USPQ2d 1746, 1749-50 (Fed. Cir. 1991; *In re*

Oelrich, 666 F.2d 578,581, 212 USPQ 323, 326 (C.C.P.A. 1981) ("inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient"); *Standard Oil Co. v. Montedison, S.p.A.*, 664 F.2d 356, 372, 212 USPQ 327, 341 (3d Cir. 1981) (for a claim to be inherent in the prior art it "is not sufficient that a person following the disclosure sometimes obtain the result set forth in the [claim]; it must invariably happen").

When considered in light of the appropriate legal standards set forth above, it is clear that the recited surface area stability characteristic of Claim 17 is not inherent to the composition of *Aubert*.

Instead, *Aubert* concerns compositions which present a high phasic purity and a high surface up to 1000°C. In fact, *Aubert* fails to disclose any information regarding surface area stability above 1100°C. As discussed in Example 8 of *Aubert*, which discloses a composition based on oxides of zirconium, of cerium, of lanthanum and of another rare earth which is praseodymium, after calcination for 6 hours at 900°C, 1000°C and 1100°C, the specific surfaces at 64, 49 and 13 m²/g respectively (Col. 10, lines 1-10). In contrast, as shown in paragraph [0062] of Applicants' specification, the surface of the product after calcinations for 10 hours at 1000°C and 1100°C are, respectively, 55 m²/g and 23 m²/g. Thus, comparing this data reveals that the surface area of the composition of the invention is 12% greater than *Aubert* at 1000°C and 77% greater than *Aubert* at 1100°C. This comparison clearly demonstrates that the high surface areas recited in Claim 17 at 1150°C are not inherent to *Aubert's* disclosed composition.

Thus, Claim 17 and all claims dependent thereon are patentable over *Aubert*, because *Aubert* concerns compositions which present a high phasic purity and a high surface up to 1000°C. However, at higher temperatures, the specific surface area is far less stable, and in any case, less stable than for the product of Claim 17. Thus, reconsideration is respectfully requested.

Further, according to the MPEP §2144.05(II)(B), only result effective variables can be optimized.

A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977)

Thus, where, as here, the claimed feature in dispute is a physical property of the composition, not a variable that achieves a recognized result, it is improper to allege that it would have been obvious to optimize the range thereof. Thus, the claims are further patentable over *Aubert* because the Official Action improperly argues that it would have been obvious to optimize the range.

Conclusion

In view of the foregoing, it is submitted that all claims are in condition for allowance. Should any questions arise in connection with this application or should the Examiner believe that a telephone conference with the undersigned would be helpful in resolving any remaining issues pertaining to this application, the undersigned respectfully requests that she be contacted at the number indicated below.

The Director is hereby authorized to charge any appropriate fees under 37 C.F.R. §§ 1.16, 1.17 and 1.20(d) and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: May 19, 2010

By: Nancy K. Britt
Nancy K. Britt
Registration No. 57856

Customer No. 21839
703 836 6620